- development and implementation of new water supply practices and improvement of existing industrial technologies for water treatment and wastewater treatment and related technological equipment;
- development and implementation of a continuous improved system for supervision and monitoring of the quality of water sources of water supply systems and the quality of drinking water;
- development and introduction into practice of water supply of new effective reagents, filter materials, sorbents, etc.

Scientific and research activities:

- development of the state program of scientific research and research development in priority areas of water treatment technologies and improving the quality of drinking water.

Carrying out the above measures will improve the condition in the field of water supply to the population of the Kyrgyz Republic with clean drinking water and solve the issues of disposal and treatment of used wastewater and their further disposal. All this will improve the sanitary-epidemiological state in terms of providing the population of the Kyrgyz Republic with clean drinking water and significantly improve the ecological state of the country's water resources.

PHOTOCATALYTIC ACTIVITY OF TiO_2 NANOCOMPOSITES DOPED WITH Sn

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Titanium dioxide (TiO_2) has been used as a photocatalyst in water purification and environmental applications because of its efficient photoactivity, non-toxicity and high stability. However, due to large band gap energy, the photocatalytic activity of TiO_2 is restrained by the fast recombination of the photogenerated electron-hole pairs and photocatalysis can be activated only with UV-light irradiation, that limits the usage of TiO_2 [1]. Our research aims to increase the photocatalytic activity of TiO_2 by doping with Sn.

TiO_2-SnO_2 nanocomposites were received by the hydrothermal method using titanium isopropoxide and tin (II) chloride, as previously described in [2]. All samples: HT90P2510Sn(II)s, 1HT90Ti10Sn(II)s, 2HT90Ti10Sn(II)s. HT90P2510Sn(II)s contain 90% and 10% of TiO_2 and SnO_2 respectively. HT90P2510Sn(II)s was synthesized on base of AEROXIDE® TiO_2 P25.

The synthesized samples show high photocatalytic activity towards cationic (methylene blue) and cationic (Congo red) organic dyes, which is shown in Fig.1. Photocatalytic activity of AEROXIDE® TiO_2 P25 and TiO_2 synthesized by ourselves are also measured for comparison.

To sum up, some of the synthesized samples have higher photocatalytic activity then commercially available AEROXIDE® TiO_2 P25 and TiO_2 synthesized by ourselves.

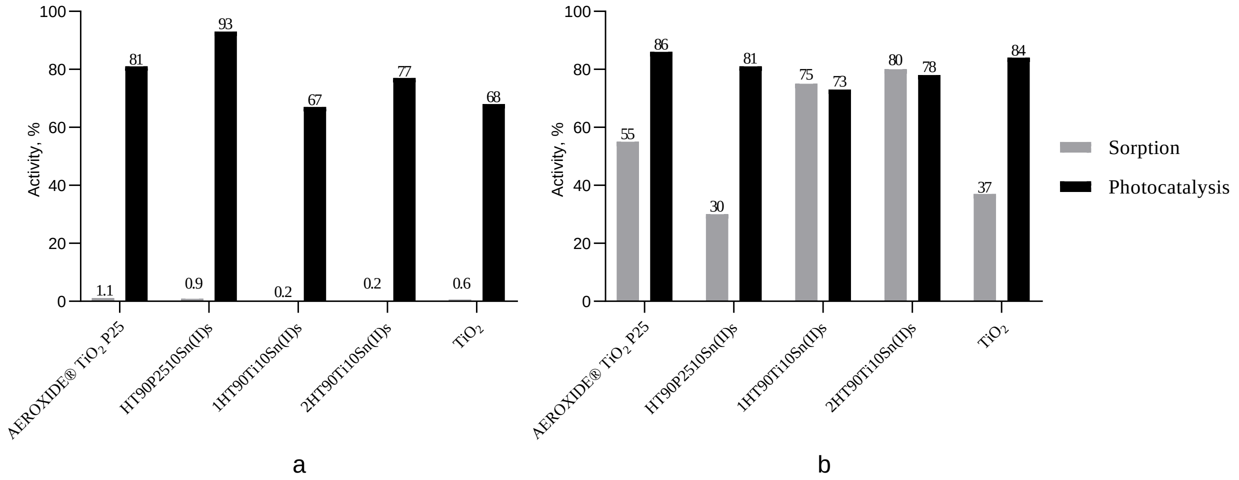

Fig.1. Photocatalytic and sorption activity of the TiO_2-SnO_2 nanocomposites towards methylene blue (a) and Congo red (b) organic dyes comparing with AEROXIDE® TiO_2 P25 and TiO_2 synthesized in our laboratory.

1. Moma, J., Baloyi, J. (2006). Modified Titanium Dioxide for Photocatalytic Applications. doi: 10.5772/intechopen.79374

2. Kutuzova, A. S., & Dontsova, T. A. (2018). Characterization and properties of TiO_2-SnO_2 nanocomposites, obtained by hydrolysis method, (0123456789), 1–8. doi:10.1007/s13204-018-0754-4

PROBLEMY Z AUTOMATYCZNĄ BUDOWĄ HYDRAULICZNYCH MODELI SIECI WODOCIĄGOWYCH I ICH KALIBRACJĄ

PROBLEMS WITH AUTOMATIC CONSTRUCTION AND CALIBRATION OF HYDRAULIC WATER SUPPLY NETWORKS MODELS

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W ostatnich latach przedsiębiorstwa wodociągowe coraz bardziej zainteresowane są wdrażaniem narzędzi informatycznych, które wspomagać będą zarządzanie sieciami wodociągowymi. W tym celu tworzone są modele numeryczne sieci wodociągowych, często przy użyciu oprogramowania umożliwiającego automatyczną konwersję danych do modelu z istniejących baz danych typu GIS. Odwzorowanie struktury geometrycznej modelowanej sieci wodociągowej jest tylko początkiem pracy. Zanim model będzie narzędziem wspomagającym decyzje eksploatacyjne, musi być poddany procesom weryfikacji oraz kalibracji. Czynności te mają na celu: jak najwierniej odwzorować warunki hydrauliczne oraz topograficzne, wyeliminować błędy powstałe podczas importu danych z bazy GIS do programu umożliwiającego modelowanie sieci, a także, jak najdokładniej dopasować